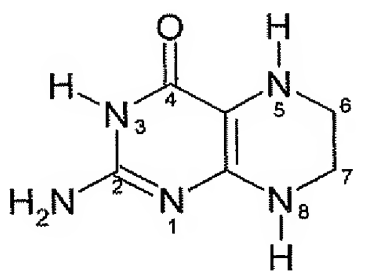
The listing of claims will replace all prior versions, and listings, of claims in the application:

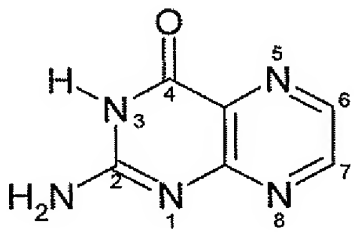
Listing of Claims:

1. (Previously Presented) A process for preparing tetrahydropterin of the following formula



or a tetrahydropterin compound of said tetrahydropterin that is substituted at the 6-, or 7- or 6- and 7- position or positions,

comprising hydrogenating pterin of the following formula



or a pterin compound of said pterin that is monosubstituted at the 6-, or 7- or 6- and 7- position or positions,

with hydrogen in a polar reaction medium in the presence of a hydrogenation catalyst that is a metal complex that is soluble in the reaction medium, wherein the catalyst contains a ligand which is (i) triarylphosphine, (ii) tetramethylene phenylphosphine (iii) pentamethylene phenylphosphine, or (iv) a bidentate ligand with a tertiary amine group and a phosphine group or with two tertiary phosphine groups as complexing groups, wherein the bidentate ligands form together with a metal atom a five- to ten membered ring.

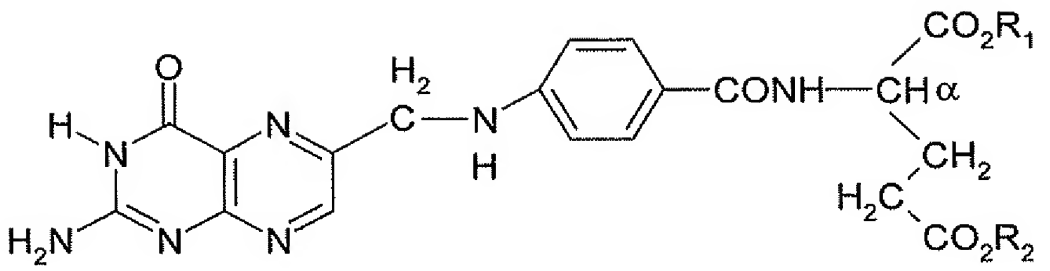
2. (Previously Presented) A process according to claim 1, wherein the polar reaction medium is an aqueous or alcoholic reaction medium.

3. (Previously Presented) A process according to claim 1, wherein the pterin compound is folic acid, a folic acid salt, a folic acid ester, a folic acid ester salt or a dihydro form thereof, with the proviso that in the event of using folic acid, a carboxylic acid thereof or a dihydro form thereof, the reaction medium is aqueous, and in the event of using a folic acid ester, a folic acid ester salt or a dihydro form thereof, the reaction medium is an alcohol.

4. (Previously Presented) A process according to claim 1, wherein the metal complex contains a chiral ligand.

5. (Previously Presented) A process according to claim 3, wherein the metal complex contains a chiral ligand.

6. (Previously Presented) A process according to claim 5, wherein the folic acid ester salt is of formula III and is in the form of a single enantiomer or a mixture of enantiomers of formula III,



x HA (III),

in which

one of R_1 or R_2 is H, and the other one of R_1 or R_2 is a monovalent hydrocarbon radical or a hydrocarbon radical attached via a carbon atom in which one or more carbon atoms are each independently replaced by oxygen, sulfur, NH, -N=, or -N(C_1-C_4 Alkyl)-, or

both R_1 and R_2 independently of one another represent a monovalent hydrocarbon radical or a hydrocarbon radical attached via a carbon atom in which one or more carbon atoms are each independently replaced by oxygen, sulfur, NH, -N=, or -N(C_1-C_4 Alkyl)-,

HA stands for a monobasic to tribasic inorganic or organic acid, and

x denotes an integer from 1 to 6 or a fractional number between 0 and 6.

7. (Previously Presented) A process according to claim 6, wherein HA is unsubstituted or substituted phenylsulphonic acid.

8. (Previously Presented) A process according to claim 1, wherein said process is carried out at a hydrogen pressure of 1 to 500 bars.

9. (Previously Presented) A process according to claim 1, wherein said process is carried out at a temperature is 0 to 150^0 C.

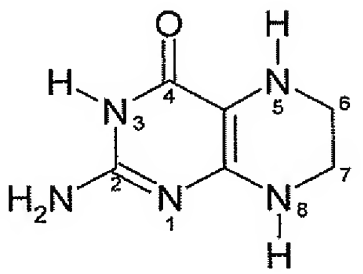
10. (Previously Presented) A process according to claim 1, wherein the molar ratio of pterin or pterin compound to catalyst is 10 to 100,000.

11. (Previously Presented) A process according to claim 1, wherein the reaction medium is water or water in admixture with an organic solvent.

12. (Previously Presented) A process according to claim 2, wherein the alcoholic reaction medium is an alcohol, or an alcohol in admixture with an organic solvent.

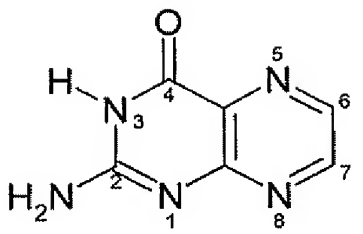
13. (Previously Presented) A process according to claim 1, wherein the metal complex contains a d-8 metal.

14. (Currently Amended) A process for preparing tetrahydropterin of the following formula



or a tetrahydropterin compound of said tetrahydropterin that is substituted at the 6-, or 7- or 6- and 7- position or positions,

comprising hydrogenating pterin of the following formula



or a pterin compound of said pterin that is monosubstituted at the 6-, or 7- or 6- and 7- position or positions,

with hydrogen in a polar reaction medium in the presence of a hydrogenation catalyst that is a metal complex that is soluble in the reaction medium, wherein

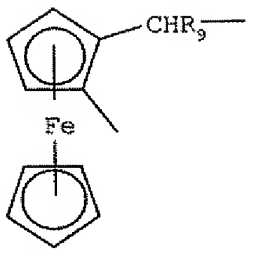
the catalyst has a ligand that is of formula IV, V, VI, VII, VIII, IX, X, XI, XII, XIII, XIV, XV, XVI, XVII, ~~XVIII,~~ XIX, XX, XXI, XXII, XXIII, XXIV, XXV, XXVI, XXVII, XXVIII, XXIX, XXX, XXXI, XXXII, XXXIII, XXXIV, XXXV, XXXVI, XXXVII, XXXVIII, XXXIX, XL, Y1 or Y2,

$$R_4R_5P\text{-}R_6\text{-}PR_7R_8 \qquad (IV),$$

in which

R_4, R_5, R_7 and R_8 independently of one another represent a hydrocarbon radical with 1 to 20 carbon atoms which are unsubstituted or substituted with halogen, C_1-C_6-alkyl, C_1-C_6-haloalkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy, $(C_6H_5)_3Si$, $(C_1$-C_{12}-alkyl$)_3Si$, $-NH_2$, $-NH(C_1$-C_{12}-alkyl), -NH(phenyl), -NH(benzyl), $-N(C_1$-C_{12}-alkyl$)_2$, -N (phenyl)$_2$, -N(benzyl)$_2$, morpholinyl, piperidinyl, pyrrolidinyl, piperazinyl, -ammonium-X_3-, $-SO_3M_1$, $-CO_2M_1$, $-PO_3(M_1)_2$ ~~$-PO_3M_1$~~, or $-CO_2$-C_1-C_6-alkyl, where M_1 represents an alkali metal or hydrogen, and X_3^- is an anion of a monobasic acid; or R_4 and R_5 and/or R_7 and R_8 together denote tetramethylene, pentamethylene or 3-oxa-pentane-1,5-diyl, unsubstituted or substituted with halogen, C_1-C_6-alkyl or C_1-C_6-alkoxy, and

R_6 is C_2-C_4-alkylene, unsubstituted or substituted with C_1-C_6-alkyl, C_1-C_6-alkoxy, C_5-cycloalkyl or C_6-cycloalkyl, phenyl, naphthyl or benzyl; 1,2- or 1,3-cycloalkylene, 1,2- or 1,3-cycloalkenylene, 1,2- or 1,3-bicycloalkylene or 1,2- or 1,3-bicycloalkenylene with 4 to 10 carbon atoms, unsubstituted or substituted with C_1-C_6-alkyl, phenyl or benzyl; 1,2- or 1,3-cycloalkylene, 1,2- or 1,3-cycloalkenylene, 1,2- or 1,3-bicycloalkylene or 1,2- or 1,3-bicycloalkenylene with 4 to 10 carbon atoms, unsubstituted or substituted with C_1-C_6-alkyl, phenyl or benzyl, and attached at whose 1- and/or 2-position(s) or at whose 3-position is methylene or C_2-C_4-alkylidene; 1,4-butylene, substituted in the 2,3-positions with R_9,$R_{10}C(O-)_2$, and in the 1- and/or 4-positions unsubstituted or substituted with C_1-C_6-alkyl, phenyl or benzyl, and where R_9, and R_{10} independently of one another represent hydrogen, C_1-C_6-alkyl, phenyl or benzyl; 3,4- or 2,4-pyrrolidinylene or methylene-4-pyrrolidine-4-yl, the N-Atom of which is substituted with hydrogen, C_1-C_{12}-alkyl, phenyl, benzyl, C_1-C_{12}-alkoxycarbonyl, C_1-C_8-acyl, C_1-C_{12}-alkylamino carbonyl; or 1,2-phenylene, 2-benzylene, 1,2-xylylene, 1,8-naphthylene, 2,2'-dinaphthylene or 2,2'-diphenylene, unsubstituted or substituted with halogen, -OH, C_1-C_6-alkyl, C_1-C_6-alkoxy, phenyl, benzyl, phenyloxy or benzyloxy; or R_6 stands for a radical of one of the following formulas



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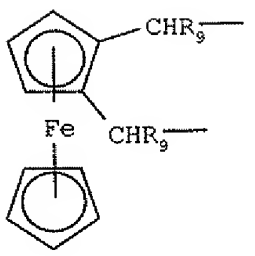

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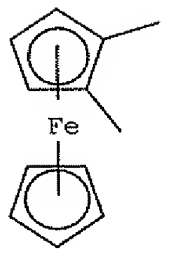

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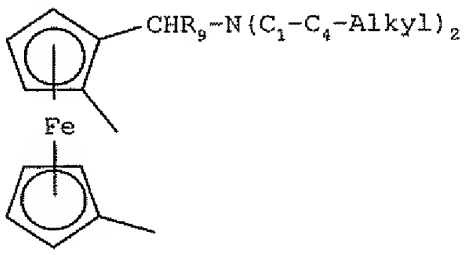

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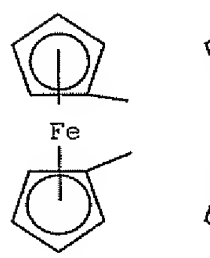

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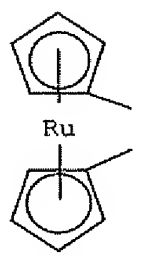

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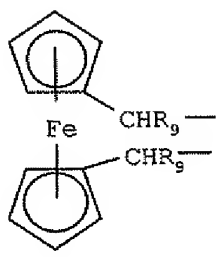

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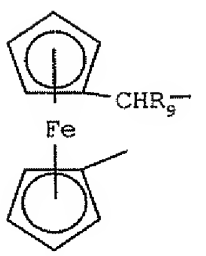

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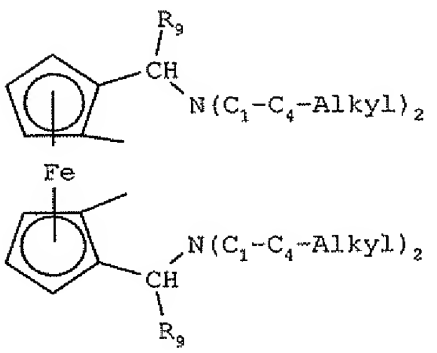
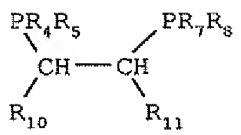


,
,

in which

R_9 denotes hydrogen, C_1-C_8-alkyl, C_1-C_4-fluoroalkyl, unsubstituted phenyl or phenyl substituted with 1 to 3 F, Cl, Br, C_1-C_4-alkyl, C_1-C_4-alkoxy or fluoromethyl;



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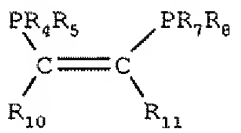

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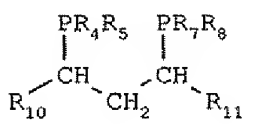

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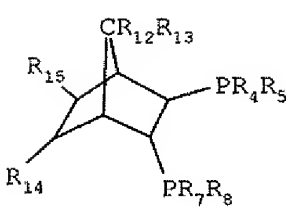

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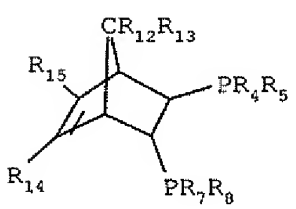

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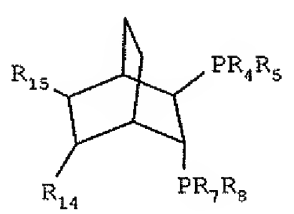

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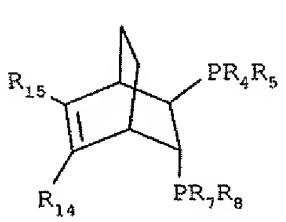
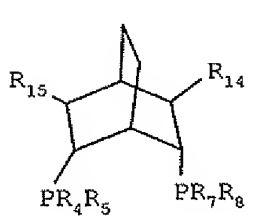


, (XI)



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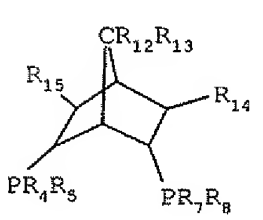

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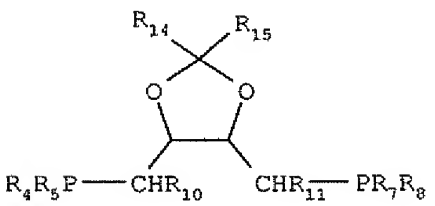
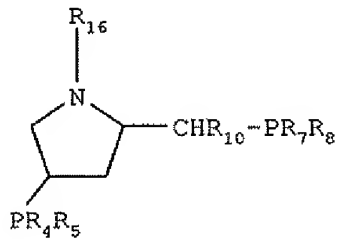


(XIV) ~~(IVX)~~,



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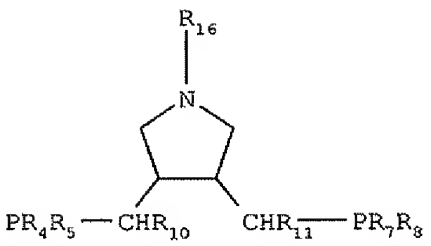

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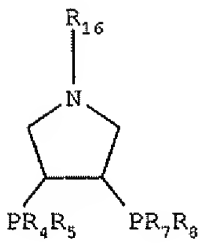

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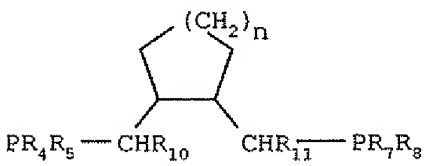
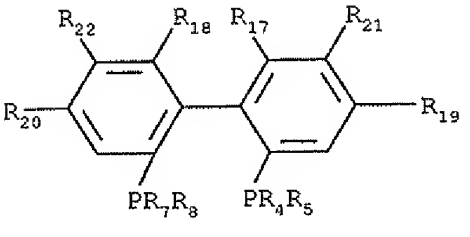


(XIX)



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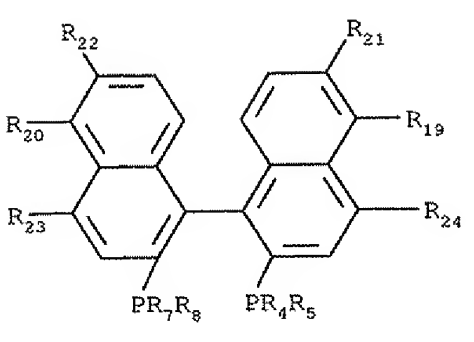

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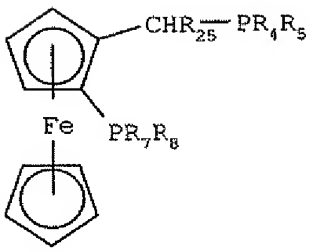

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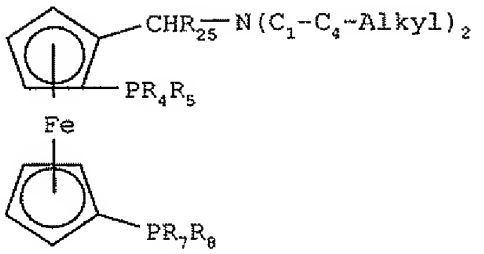


(XXIII),

in which

R_4, R_5 R_7 and R_8 have the meanings as recited above,

R_{10} and R_{11} independently of one another denote hydrogen, C_1-C_4 alkyl or benzyl or phenyl, unsubstituted or substituted with one to three C_1-C_4 alkyl or C_1-C_4 alkoxy,

R_{12} and R_{13} independently of one another represent hydrogen, C_1-C_4 alkyl, phenyl or benzyl,

R_{14} and R_{15} independently of one another denote hydrogen, C_1-C_4 alkyl, C_1-C_4 alkoxy, or benzyl or phenyl, unsubstituted or substituted with one to three C_1-C_4 alkyl or C_1-C_4 alkoxy,

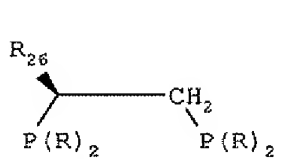
R_{16} represents hydrogen, C_1-C_{12} alkyl, unsubstituted benzyl or phenyl, or benzyl or phenyl substituted with one to three C_1-C_4 alkyl or C_1-C_4 alkoxy, C_1-C_{12} alkoxy-C(O)-, unsubstituted phenyl-C(O)- or benzyl-C(O)-, or phenyl-C(O)- or benzyl-C(O)- substituted with one to three C_1-C_4 alkyl or C_1-C_4 alkoxy, C_1-C_{12} alkyl-NH-CO-, or phenyl-NH-C(O)- or benzyl-NH-C(O)-, unsubstituted or substituted with one to three C_1-C_4 alkyl or C_1-C_4 alkoxy,

n stands for 0, 1 or 2,

R_{17} and R_{18} are C_1-C_4 alkyl or C_1-C_4 alkoxy, or R_{17} and R_{18} together denote oxadimethylene,

R_{19}, R_{20}, $\underline{R_{21}}$ ~~R_{21}~~, R_{22}, R_{23} and R_{24} are independently of one another H, C_1-C_4 alkyl, C_1-C_4 alkoxy, C_5- or C_6 cycloalkyl or C_5- or C_6 cycloalkoxy, phenyl, benzyl, phenoxy, benzyloxy, halogen, OH, -$(CH_2)_3$-C(O)-O-C_1-C_4-alkyl, -$(CH_2)_3$-C(O)-N(C_1-C_4-alkyl)$_2$ or -N(C_1-C_4-alkyl)$_2$, or R_{19} and R_{21}, and/or R_{17} and R_{21}, and/or R_{20} and R_{22}, and/or R_{18} and R_{22}, or R_{21} and R_{23} and/or R_{22} and R_{24} together <u>with the respective carbon atoms to which they are attached</u> represent a fused-on 5 or 6-membered, monocyclic or bicyclic hydrocarbon ring, and

R_{25} is C_1-C_4 alkyl;



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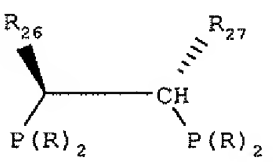

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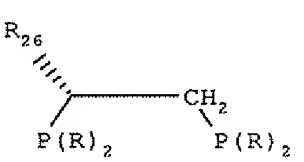

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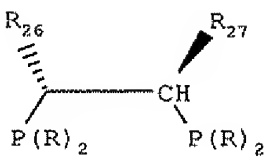

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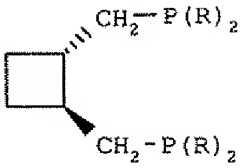

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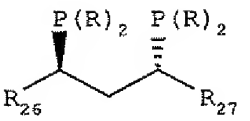

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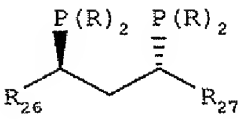
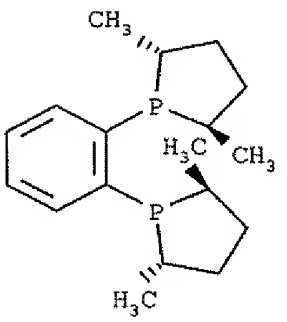


(XXX),



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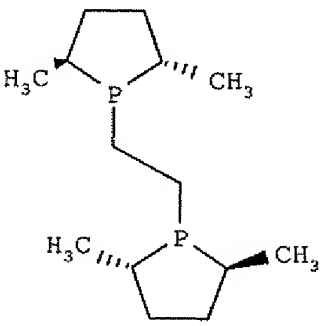

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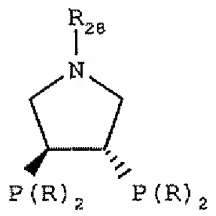

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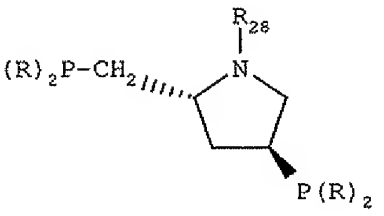

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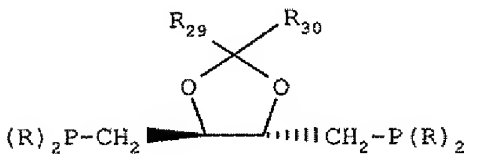

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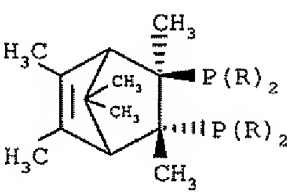

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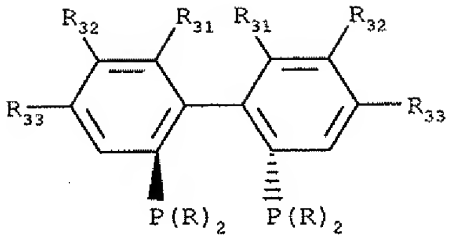

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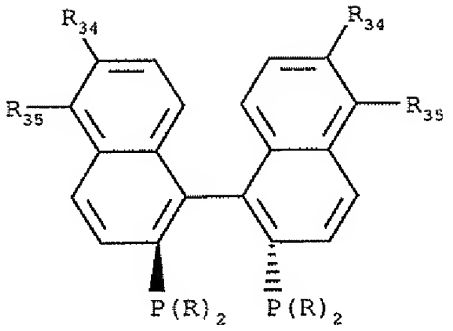
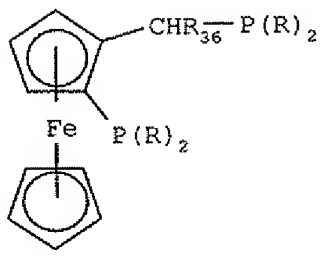


(XXXVIII),



(XXXIX)

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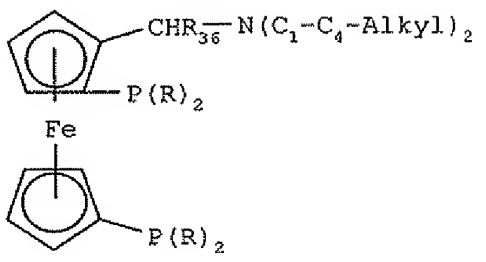


(XL),

in which

R stands for cyclohexyl or unsubstituted phenyl or phenyl substituted with one to three C_1-C_4-alkyl, C_1-C_4-alkoxy, trifluoromethyl, or an $-NH_2$ (C_1-C_4-alkyl)NH-, (C_1-C_4-alkyl)$_2$N-,

R_{26} and R_{27} independently of one another denote C_1-C_4-alkyl, phenyl or benzyl,

R_{28} represents C_1-C_8-alkyl, C_1-C_8-acyl or C_1-C_8-alkoxycarbonyl,

R_{29} stands for hydrogen, C_1-C_4-alkyl, phenyl or benzyl,

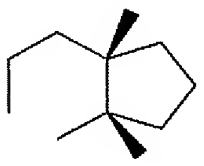
R_{30} represents C_1-C_4-alkyl, phenyl or benzyl,

R_{31} denotes methyl, methoxy, or both R_{31} together denote oxadimethylene,

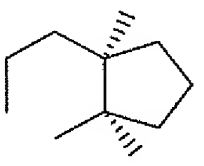
R_{32} and R_{33} independently of one another represent H, C_1-C_4-alkyl, C_1-C_4-alkoxy or (C_1-C_4-alkyl)$_2$N-,

R_{34} and R_{35} independently of one another represent H, C_1-C_4-alkyl, C_1-C_4-alkoxy,

-$(CH_2)_3$-C(O)-O-C_1-C_4-alkyl, -$(CH_2)_3$-C(O)-N(C_1-C_4-alkyl)$_2$ or one pair R_{34} and R_{35} together represents a radical of formula XLI and the other pair R_{34} and R_{35} together represents a radical of formula XLII



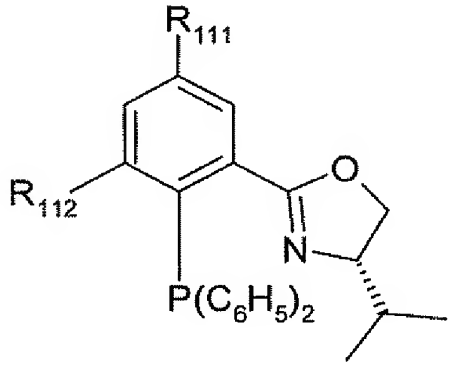
(XLI),



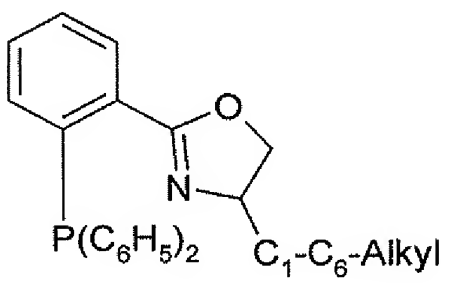
(XLII),

and

R_{36} stands for C_1-C_4-alkyl,



(Y1)

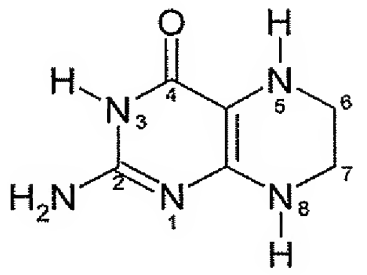


(Y2)

wherein R_{111} and R_{112} are each independently H or methyl.

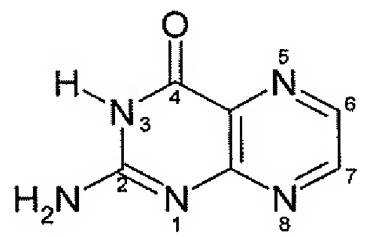
15-28. (Cancelled)

29. (Previously Presented) A process for preparing tetrahydropterin of the following formula



or a tetrahydropterin compound of said tetrahydropterin that is substituted at the 6-, or 7- or 6- and 7- position or positions,

comprising hydrogenating pterin of the following formula



or a pterin compound of said pterin that is monosubstituted at the 6-, or 7- or 6- and 7- position or positions,

with hydrogen in alcohol or in alcohol in admixture with an organic solvent in the presence of a hydrogenation catalyst that is a metal complex that is soluble in the reaction medium.

30-32. (Cancelled)

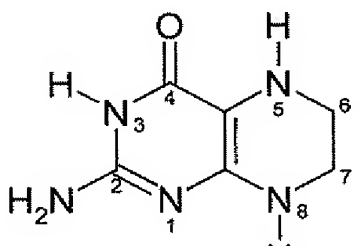
33. (Previously Presented) A process according to claim 3, wherein the hydrogenation is carried out at elevated pressure.

34. (Previously Presented) A process according to claim 1, wherein the metal complex contains iridium, rhodium or ruthenium.

35-36. (Cancelled)

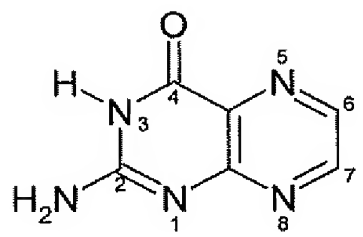
37-39. (Cancelled)

40. (Previously Presented) A process for preparing tetrahydropterin of the following formula



or a tetrahydropterin compound of said tetrahydropterin that is substituted at the 6-, or 7- or 6- and 7- position or positions,

comprising hydrogenating pterin of the following formula



or a pterin compound of said pterin that is monosubstituted at the 6-, or 7- or 6- and 7- position or positions,

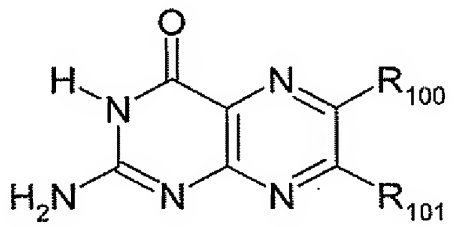
with hydrogen in alcohol or in alcohol in admixture with an organic solvent in the presence of a hydrogenation catalyst that is a metal complex that is soluble in the reaction medium, wherein

the pterin compound is folic acid, a folic acid salt, a folic acid ester, a folic acid ester salt or a dihydro form thereof, with the proviso that in the event of using folic acid, a carboxylic acid thereof or a dihydro form thereof, the reaction medium is aqueous, and in the event of using a folic acid ester, a folic acid ester salt or a dihydro form thereof, the reaction medium is an alcohol.

41-44. (Cancelled)

45. (Previously Presented) A process according to claim 1, wherein the pterin compound is a pterin that is substituted in the 6- position.

46. (Previously Presented) A process according to claim 1, wherein the pterin compound is of formula (A)



(A)

in which

R_{101} is H or independently has the meaning of R_{100}, and

R_{100} is an organic radical attached via a C, O or N atom and having 1 to 50 carbon atoms.

47. (Previously Presented) A process according to claim 46, wherein R_{100} contains 1 to 30 carbon atoms and is not interrupted or is interrupted by one or more of -O-, -NH-, -N(C_1-C_4-alkyl)-, -C(O)-, -C(O)O-, -OC(O)-, -OC(O)O-, -C(O)NH-, -NHC(O)-, -NHC(O)O-, -OC(O)NH-, -NHC(O)NH-, -C(O)N(C_1-C_4-alkyl)-, -N(C_1-C_4-alkyl)C(O)-, -N(C_1-C_4-alkyl)C(O)O-, -OC(O)N(C_1-C_4-alkyl)-, -N(C_1-C_4-alkyl)C(O)N(C_1-C_4-alkyl)-, and which is unsubstituted or is substituted with F, Cl, Br, -CN, -OCN, -NCO, -OH, -NH_2, -N$H$$C_1$-$C_4$-alkyl, -

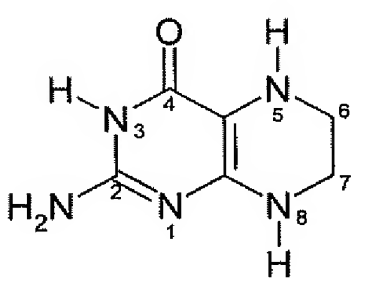
$N(C_1\text{-}C_4\text{-alkyl})_2$, $C_1\text{-}C_4$-alkyl, $C_1\text{-}C_4$-haloalkyl, $C_1\text{-}C_4$-hydroxyalkyl, $C_1\text{-}C_4$-alkoxy, $C_1\text{-}C_4$-haloalkoxy, -C(O)OH, $-C(O)OM_{100}$, $-C(O)OC_1\text{-}C_4$-alkyl, $-C(O)NH_2$, $-C(O)NHC_1\text{-}C_4$-alkyl, $-C(O)N(C_1\text{-}C_4\text{-alkyl})_2$, R_{102}-C(O)O-, R_{102}-OC(O)O-, R_{102}-C(O)NH-, R_{102}-C(O)N($C_1\text{-}C_4$-alkyl)-, R_{102}-NHC(O)NH-, R_{103}C(O)- or -CH(O), wherein

M_{100} is Li, K, Na, NH_4^+, or ammonium with 1 to 16 carbon atoms,

R_{102} is $C_1\text{-}C_8$-alkyl, C_5- or C_6-cycloalkyl, phenyl or benzyl, and

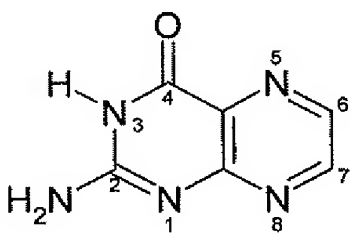
R_{103} is $C_1\text{-}C_4$-alkyl, phenyl or benzyl.

48. (Previously Presented) A process for preparing tetrahydropterin of the following formula



or a tetrahydropterin compound of said tetrahydropterin that is substituted at the 6-, or 7- or 6- and 7- position or positions,

comprising hydrogenating pterin of the following formula



or a pterin compound of said pterin that is monosubstituted at the 6-, or 7- or 6- and 7- position or positions,

with hydrogen in a polar reaction medium in the presence of a hydrogenation catalyst that is a metal complex that is soluble in the reaction medium of formula XLIV, XLIVa or XLIVb,

$[X_7Me_2YZ]$ (XLIV), $[X_7Me_2Y]^+A_2^-$ (XLIVa) $[X_7Ru(II)X_8X_9]$(XLIVb),

in which

Y stands for monoolefin ligands or a diene ligand;

X_7 represents an achiral or chiral ditertiary diphosphine, that forms a 5 to 7 membered ring with the metal atom Me_2 or Ru;

X_7 represents an achiral or chiral ligand that forms a 5 to 7 membered ring with the metal atom Me_2 or Ru, wherein said ligand contains two tertiary phosphine groups;

Me_2 denotes Ir(I) or Rh(I);

Z represents –Cl, -Br, or –I; and

A_2 is ClO_4^-, $CF_3SO_3^-$, $CH_3SO_3^-$, HSO_4^-, BF_4^-, $B(Phenyl)_4^-$, PF_6^-, $SbCl_6^-$, AsF_6^- or SbF_6^-;

X_8 and X_9 are the same or different and have the meaning of Z or A_2, or X_8 has the meaning of Z or A_2 and X_9 stands for hydride.

49. (Previously Presented) A process according to claim 6, wherein R_1 and/or R_2 are, each independently,

pyrrolidinyl, piperidinyl, morpholinyl, tetrahydropyranyl, piperazinyl, pyrrolidinyl methyl, pyrrolidinyl ethyl, piperidinyl methyl, piperidinyl ethyl, morpholinyl methyl, morpholinyl ethyl, tetrahydropyranyl methyl, tetrahydropyranyl ethyl, piperazinyl methyl or piperazinyl ethyl.

50. (Cancelled)

51. (Previously Presented) A process according to claim 14, wherein the catalyst has a ligand that is of formula Y1 or Y2.

52. (Previously Presented) A process according to claim 14, wherein the reaction medium is an alcoholic reaction medium.

53. (Previously Presented) A process according to claim 14, wherein the reaction medium is an aqueous reaction medium.

54. (Previously Presented) A process according to claim 14, wherein the catalyst has a ligand that contains one or more water-solubilising polar substituents.

55. (Previously Presented) A process according to claim 14, wherein the catalyst has a ligand that is of formula IV.

56. (Currently Amended) A process according to claim 14, wherein the catalyst has a ligand that is of formula V, VI, VII, VIII, IX, X, XI, XII, XIII, XIV, XV, XVI, XVII, ~~XVIII,~~ XIX, XX, XXI, XXII or XXIII.

57. (Previously Presented) A process according to claim 14, wherein the catalyst has a ligand that is of formula XXIV, XXV, XXVI, XXVII, XXVIII, XXIX, XXX, XXXI, XXXII, XXXIII, XXXIV, XXXV, XXXVI, XXXVII, XXXVIII, XXXIX, or XL.